Base from U.S. Geological Survey topographic series, 1:250,000, Demarcation Point (1955), Flaxman Island (1955), Mt. Michelson (1956),

and Barter Island (1959) quadrangles, Alaska

B E A U F O R T, Oil seep and oil-impregnated Shales have oil odor and Quaternary sands sands are oil bearing Oil stained Small seafloor craters and acoustic anomalies on high resolution seismic Kemik Sandstone (Kke) repeated by thrust faulting Lightly oil

Geology from Reiser and others (1971, 1980) and unpublished mapping by C.M. Molenaar, A.R. Kirk, L.B. Magoon, A.C. Huffman, and J.S. Kelley

GEOLOGIC MAP OF THE DEMARCATION POINT, MT. MICHELSON, FLAXMAN ISLAND, AND BARTER ISLAND QUADRANGLES, ALASKA

5 0 5 10 15 20 25 MILES

5 0 5 10 15 20 25 KILOMETERS

Compiled by

J.W. BADER

1984

- Qu* QUATERNARY DEPOSITS, UNDIVIDED--Includes alluvium, beach deposits, colluvium, alluvial fans, terrace deposits, marine terrace deposits, glacial deposits, glacial fluvial deposits, and landslides.
- T TERTIARY ROCKS--Poorly consolidated gray siltstone, mudstone, sandstone, and lesser amounts of conglomerate. As much as 2000 m thick on north flank of the Marsh Creek anticline. Marine and minor
- TK, LOWERMOST TERTIARY AND UPPERMOST CRETACEOUS ROCKS-thick- bedded, fine-to coarse-grained, lithic sandstone, conglomerate, and minor amounts of coal and carbonaceous shale. As much as 3200 m thick near Jago River. Nonmarine and shallow marine.
- TK2 LOWERMOST TERTIARY AND UPPERMOST CRETACEOUS ROCKS--Gray shale and siltstone containing interbeds of mostly thin-bedded, fine to very fine grained lithic sandstone (turbidites). 1500 to 1800 m thick in wells west of the Canning River. Deep-water marine.
- UK UPPER CRETACEOUS ROCKS--Mainly dark-gray, bentonitie shale containing thin- to thick-bedded, very fine to part. Fine grained pyroclastics in middle part of unit weather yellow, greenish-gray and, in areas surrounding the Sadlerochit Mountains, bright red. Gamma ray zone at base. 500 m thick at Ignek Valley. Deep-water marine.
- LK LOWER CRETACEOUS ROCKS--Lower part (upper Neocomian)--Non- bentonitic shale containing common to rare chert and quartzite pebbles (pebble shale unit--about 100 m thick). Marine. Upper part (Albian) in upper Arctic Creek area: Interbedded shale and very fine to fine grained lithic sandstone (turbidites). Deep water
- K CRETACEOUS ROCKS UNDIVIDED--Dark-gray shale and thinto thick-bedded, very fine to fine grained lithic sandstone (turbidites). Deep water marine.
- Kke KEMIK SANDSTONE (Hauterivian) -- Medium to light-gray, fine to very fine grained quartzose sandstone containing tripolitic chert grains. As much as 30 m thick. Not present in most areas where it is not mapped. Shallow marine.
- Kb BATHTUB GRAYWACKE (Lower Cretaceous-Albian?)--Greenish- gray mostly thick-bedded, fine grained, very lithic sandstone (graywacke). Contains common bimodal medium to coarse sand grains and minor amounts of conglomerate. Sandstone units are separated by thick to thin dark-gray, silty shale units. 750+m thick (top not exposed). Exposed only at Bathtub Ridge in T. 4 S., R's. 39-41 E. Deep-
- Kk KONGAKUT FORMATION (Lower Cretaceous) -- Exposed at Bathtub Ridge. Lower part is mostly dark-gray, locally fossiliferous (Valanginian) shale (clay shale member or equivalent to upper part of Kingak Shale), which is overlain by thin discontinuous quartzose sandstone beds (Kemik Sandstone Member), which in turn is overlain by manganiferous shale containing rare chert and quartzite pebbles (pebble shale member). Upper part is dark-gray silty shale in which lower half is more resistant to erosion (siltstone member). Lower part is 350-400 m thick and is part of a northerly derived Ellesmerian sequence. Upper part is about 700 m thick, is part of the southerly derived Brookian sequence, and is not recognized in the foothills and coastal plain.
- JK JURASSIC AND LOWERMOST CRETACEOUS ROCKS--Dark-gray shale. Lower part is Kingak Shale and upper part, which contains rare chert and quartzite pebbles is pebble shale unit. Kemik Sandstone, which separates units, is not present. As much as 1000 m thick.
- JKk KINGAK SHALE (Jurassic-lower Neocomian)--Dark -gray non-bentonitic shale containing common ironstone concretions. Lower Neocomian part is preserved only in areas southwest of Ignek Valley. As much as 900 m thick. Marine.
- JR KINGAK SHALE, SHUBLIK FORMATION, AND KAREN CREEK SAND-STONE, UNDIVIDED--As much as 1170 m thick.
- R K KAREN CREEK SANDSTONE (Upper Triassic)-Dark-gray very fine grained quartzitic sandstone and siltstone. Locally calcareous or dolomitic. Phosphatic nodules common. Unit absent from southern part of the Demarcation Point quadrangle. As much as 38 m thick.
- Rs SHUBLIK FORMATION (Triassic) -- Interbedded black shale, black calcareous siltstone, and black limestone. Abundantly fossiliferous. Unit absent from the southern part of the Demarcation Point quadrangle (Bathtub Ridge area). As much as 140 m thick.

- DESCRIPTION OF MAP UNITS
 - RKS KAREN CREEK SANDSTONE AND SHUBLIK FORMATION, UNDIVIDED -- As much as 170 m thick.

Ru TRIASSIC ROCKS, UNDIVIDED

- R Ps SADLEROCHIT GROUP, UNDIVIDED (Permian and Triassic) --Composed of the Ivishak and Echooka Formations. These formations are readily recognized in field traverse but mapped here as Sadlerochit Group, undivided owing to limits of scale and field control. Ivishak Formation, undivided (Lower Triassic)--Comprises three lithologic units. Upper unit, Fire
- Creek Siltstone Member, medium-dark-gray thin-bedded to massive commonly laminated siliceous siltstone, minor silty shale, and argillaceous sandstone. Contains middle Early Triassic (Smithian) fossils. As much as 135 m thick. Middle unit, Ledge Sandstone Member, clean light-gray massive sandstone. Weathers red to reddish brown. Locally conglomeratic. As much as 134 m thick. Lower unit, Kavik Member, dark-colored, laminated to thin-bedded silty shale and siltstone with minor argillaceous sandstone beds. Fossils of early Triassic (Griesbachian) age collected from this unit (Detterman and others, 1975). As much as 200 m thick.
- Echooka Formation, undivided (Lower and Upper Permian). Comprises two lithologic units. Upper unit, Ikiakpaurak Member, red-weathering resistant ferruginous orthoquartzite, quartzitic sandstone, and siltstone. Contains late Permian (Guadalupian) fossils at base of upper unit, probably equivalent in age to top of lower unit to the south of the Demarcation Point quadrangle. Thickness of upper unit 50 to 110 m; thins to north. Lower unit, Joe Creek Member, almost entirely restricted to extreme southern part of the Demarcation Point quadrangle. Best exposed in ridge north of Joe Creek south of map area. Top of lower unit thin-to medium-bedded quartzose calcarenite and biogenetic limestone that includes brachiopod coquinas. Thickness approximately 20 m. Top of lower unit underlain by about 25 m of medium- to thick-bedded chert and siliceous siltstone. Base of Lower unit yields Early and Late Permian (Wolfcampian to Guadalupian) fossils. Total thickness for lower unit about 100 m; thins rapidly to northwest (Detterman and others, 1975).
- PM1 LISBURNE GROUP, UNDIVIDED (Mississippian and Pennsylvanian) -- Upper unit (Wahoo Limestone) fine grained limestone and oolitic limestone, some glauconite and minor dolomite. Weathers characteristic light gray to yellowish cream. Contains megafauna and microfauna of Morrowan and Atokan (Early and Middle Pennsylvanian) age. Thickness of upper unit variable due to erosion, 0 to about 375 m. Lower unit (Alapah Limestone) gray bioclastic limestone, dolomite, and black chert. Weathers gray to dark gray. Contains megafauna and microfauna of Meramecian and Chesterian (Late Mississippian) age. Thickness of lower unit 275 to 655 m. In extreme southcentral part of the Demarcation Point quadrangle, unit includes unmapped areas of Joe Creek Member of Echooka Formation (Lower Permian). In the southern part of the Mount Michelson quadrangle, units lower part is shaly and the basal contact is obscure.
- PMI-MKY LISBURNE GROUP AND KAYAK SHALE, UNDIVIDED
- Me ENDICOTT GROUP, UNDIVIDED (Mississippian) -- Composed of Kayak Shale, Itkilyariak Formation, Kekiktuk Conglomerate, and unnamed siltstone. Locally not differentiated from the Lisburne Group. As much as
- Mky KAYAK(?)SHALE--Dark-gray to black shale. Locally interbedded with gray- to red-weathering limestone. Locally contains anthracite at base. Includes unmapped area of probable Itkilyariak Formation in secs. 2 and 12, T. 1 S., R. 39 E. and in secs. 13 and 16, T. 1 N., R. 44 E. As much as 250 m thick.
- Mkc KEKIKTUK CONGLOMERATE -- Resistant massive quartzite and granule to cobble conglomerate. Quartzite is generally light gray, clean, well indurated, and weathers light gray; locally iron stained. Conglomerate is interbedded and lenticular in quartzite; clasts predominantly of quartz and chert. Locally contains anthracite. As much as 130 m thick.
- Mks UNNAMED SILTSTONE--Dark gray phyllitic siltstone with laminae and knots of red weathering ferruginous siltstone. Locally contains anthracite. Distinguished only in southwestern part of the Mt. Michelson qua-
- pMu* PRE-MISSISSIPPIAN ROCKS UNDIVIDED--Igneous, metamorphic, and sedimentary rocks of pre-Mississippian age. Greater than 10,000 ft thick.

Description of map units modified from Reiser and others (1971,1980). Includes units from unpublished mapping by C.M. Molenaar, A.R. Kirk, L.B. Magoon, and A.C. Huffman.

*-- In order to emphasize the petroleum prospective rocks in this area, these rocks, which have been mapped in considerable detail by Reiser and others, (1970,1971,1980), have been shown as a single

EXPLANATION

- concealed; queried where uncertain cealed; queried where uncertain. Ball and bar on down-thrown side Fault-Showing relative horizontal movement
- Thrust fault-Sawteeth on upper plate -.. Anticline-Showing direction of plunge; dashed where approximately located; dotted where concealed Overturned anticline-Showing direction of dip of limbs

* -.. Syncline-Showing direction of plunge; dashed where approri-

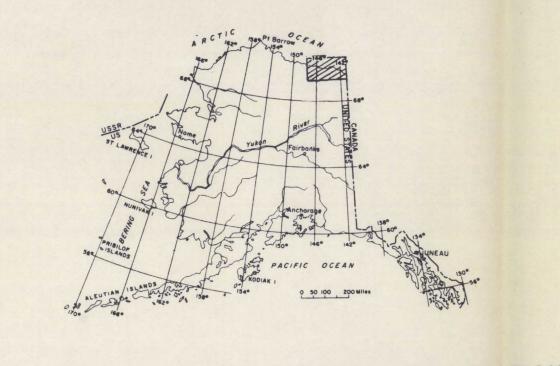
- mately located; dotted where concealed Overturned syncline-Showing direction of dip of limbs J²⁰ Strike and dip of overturned beds-Arrow indicates aerial or
- ⊕ Horizontal beds + Vertical beds Surface hole location (SHL) and bottom hole location (BHL) of wells
- Abandoned oil and gas test hole Gas Well Oil and gas well Suspended well

--- Boundary of the Alaska National Wildlife Refuge

O Well being drilled presently

Well name and number Total depth location Total depth Atlantic Richfield Co. Atlantic Richfield Co. Atlantic Richfield Co. Mobil Oil Corp. Exxon Corp. Exxon Corp. Union Oil Co. of Calif. Humble Oil and Refining Co. Mobil Oil Corp. Phillips Petroleum Co. Mobil Oil Corp. Sohio Petroleum Co Exxon Corp. Exxon Corp. Exxon Corp. 27 10N 24E 14206 Alaska State A-1 Exxon Corp. 2 11N 22E 15222 Alaska Island - 1 Sohio Petroleum Co.

EXPLORATORY WELLS



INDEX MAP OF ALASKA SHOWING MAP LOCATION

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1:250,000, 1 sheet.

This map is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature.

quadrangle, Alaska: U.S. Geological Survey Miscellaneous Investigations Series Map I-1133, scale